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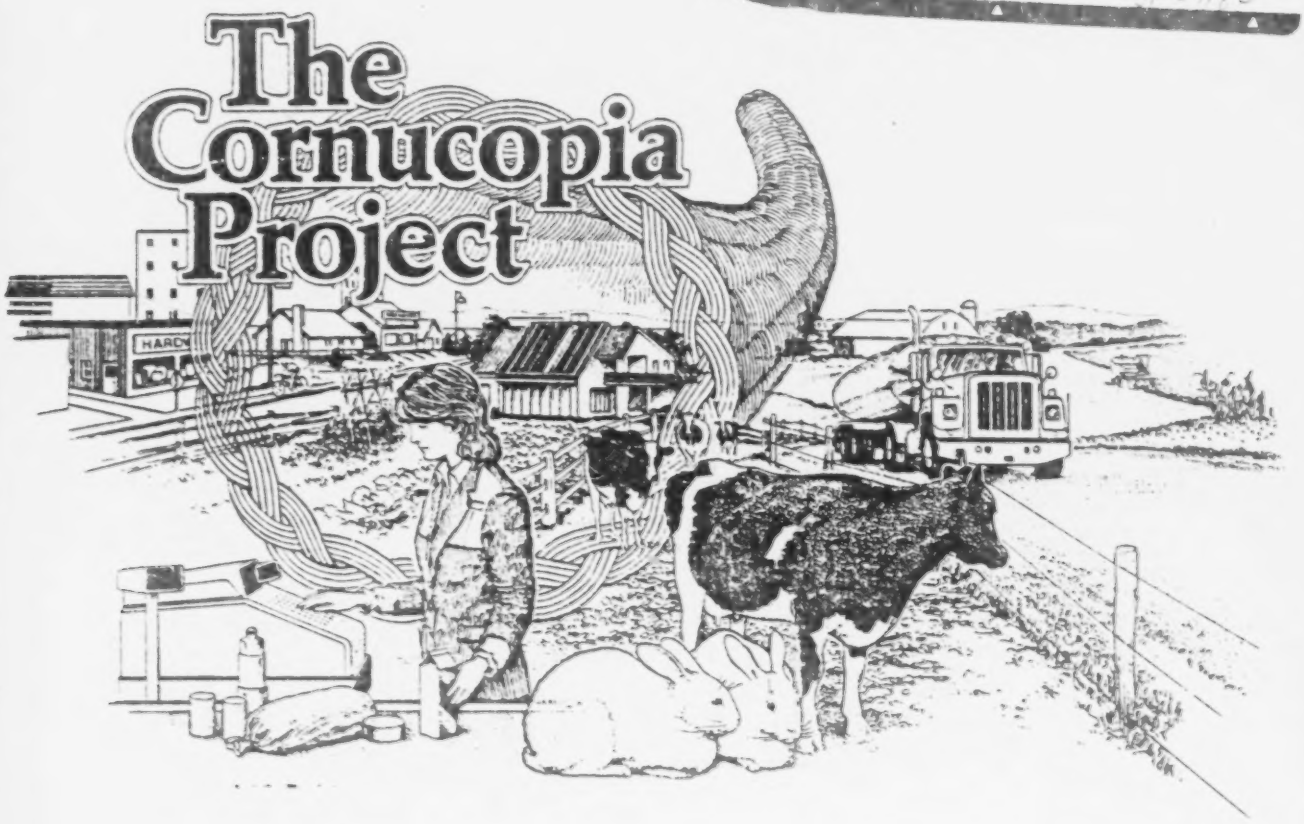

THE MICHIGAN FOOD SYSTEM: INCREASING DEPENDENCE OR SELF-RELIANCE?

A Study of the Food System of Michigan by
RICHARD STRUTHERS and ROSEMARY LEWANDO
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33 East Minor Street
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INTRODUCTION

In Governor Willian G. Milliken's annual state of the state address on January 15, 1981, he focused on actions that would diversify and strengthen Michigan's economy by recognizing its inherent strengths and by building upon these strengths. Michigan's inherent strengths are its people, their will, and its natural resources. With the decline of the automobile industry, much attention has been given to Michigan's agricultural system to assess its potential contribution to our economy. The apparent strength of agriculture in Michigan is impressive.

The combination of climate, terrain, and soils of Michigan allows a highly diversified agriculture producing nearly 50 commercial crops each year.[1] Michigan leads the nation in production of blueberries, tart cherries, cucumbers for processing, and dry beans. Other important crops include apples, asparagus, celery, carrots, spearmint, sugarbeets, strawberries, and fresh sweet corn. Farm cash receipts were $2.5 billion in 1981,[2] ranking agriculture as Michigan's second leading industry. Michigan's food system employs about 450,000 people year-round and another 40,000 jobs are generated during the summer.[3] Agriculture provides stability to Michigan's economy.[4] Indeed, our agricultural system has many strengths. But in order to build on these strengths, revitalize our economy and assure sustainability, we must also recognize our weaknesses. Issues of great concern include:

- 64 percent of the food consumed in Michigan is produced outside the state.
- We spent $7.5 billion for this imported food in 1980.
- In the last 30 years, Michigan has lost 55 percent of its farms.

- Michigan loses productive agriculture land ten times the size of Lansing each year to non-farm development.

- The amount of soil lost to sheet and rill erosion is enough to bury the city of Lansing with about a foot of soil every two years.

- Together, erosion and development decrease our productive land base by 347,504 acres each year, an area more than three times the size of Detroit.

Perhaps these issues could be ignored for awhile if not for the fact that these problems are occurring throughout the nation. Every day the United States loses the productive equivalent of 25 square miles of agricultural land to erosion and development.[5] Farm debt is increasing astronomically, up 650 percent in the last 20 years.[6] Irrigated farmlands in the West, of which we depend for much of our food, are threatened by declining water tables and increasing salt build-up in the soil. The nation's food system, from production to transporting and processing, is dependent on scarce minerals and non-renewable energy, increasing our costs and vulnerability.

Seen in this context, strengthening the food system in Michigan is not only an opportunity to revitalize our economy, but also necessary to assure a more sustainable food supply. The purpose of this paper is to address our weaknesses and offer an opportunity to revitalize our food system.

ISSUES OF CONCERN

Our food system evolved in an era of cheap and plentiful energy. As national communications and transportation networks developed, different areas of the country began specializing in producing the commodities they grew best. Michigan has moved from being fairly self-reliant to becoming heavily dependent on it. While our food system has provided a vast array of food at relatively cheap prices, with the rising cost of energy, our dependence may spell trouble.[7] Trouble could turn to disaster if our options are limited by an unchecked and dwindling resource base.

Imported Food

Currently, producing only 36 percent of the food we consume means that we import 78 percent of our beef; 68 percent of our pork; 96 percent of our chicken; 78 percent of our cheese; 100 percent of our broccoli; 89 percent of our lettuce; 49 percent of our onions; 100 percent of our spinach; 68 percent of our fresh tomatoes; 78 percent of our cantaloupe; 89 percent of our grapes; and 53 percent of our pears. In addition, because of a lack of processing facilities in Michigan, all of our corn for grain and soybeans grown for processing must be exported and their processed products imported back into Michigan.[8] Importing so much food has some major disadvantages for Michigan. This dependence means that:

1) Our food supply is vulnerable to disruption.
2) We pay more for lower quality food.
3) Our system uses huge amounts of energy.
4) Our local economy is weakened.

Vulnerability to Disruption

The equivalent of 4,739 truckloads of food come into Michigan each week to keep us well fed.[9] Much of this food is transported from places as far away as California, Florida, and Mexico.[10] Because of this dependence, an oil embargo, energy shortage, labor dispute, drought or crop failure, or any other disruption could lead to serious food shortages. A quarantine of California produce, such as the near occurrence in July, 1981 because of the Mediterranean Fruit Fly infestation, would greatly reduce the availability of fresh food in Michigan, causing prices to increase substantially. If a disruption occurred in the food supplied to an average major supermarket in Michigan, perishable items would last one week and all other items at the most one month.[11] We have already witnessed the long lines at the gas pumps during fuel shortages; the effect would be much worse if such a basic need as food were in short supply.

Cost and Quality

Of the $11 billion Michigan residents spent for food in 1980, $7.5 billion was spent for food produced outside the state. This amounts to $804 spent per person for our imported food.[12] Transportation costs alone account for $600 million of Michigan's food bill.[13] In 1980 we shipped in a total of 13,125 truckloads of fruits and vegetables into our Detroit receiving point from out of the state.[14] At an average 1981 cost of $1.12 per mile,[15] the 1501 truckloads of fresh vegetables from California alone results in a $3.7 million transportation bill. The 1,044 truckloads of fresh fruit from California amount to a $2.6 million transportation bill. These transportation costs are not likely to decrease or even stabilize in the years ahead.

Another cost of relying on distant areas to produce much of our food is hidden in our tax bill. Much of the irrigation water used in California for example, is subsidized by the federal government. This subsidy hides the real cost of the imported food and poses a disadvantage to Michigan's farmers.

While the price of food on the average is relatively cheap, many people need government assistance to acquire enough of it. In 1975, 1.5 million Michigan residents would have been deemed malnourished if not for government assistance.[16] In the face of current and pending cutbacks in assistance, the situation could be critical. With the rising costs inherent in our food system through dependence on expensive energy, the situation could become devastating.

In addition, much of our imported foods suffer in nutritional value and taste. Many foods, especially fruits, are picked before they are ripe so they can be handled and transported long distances more easily. This practice often results in food of lower nutritional value since they are picked before nutrient content is at its maximum. The travel time itself can result in nutrient destruction. For example, it has been found that tomatoes ripened on the vine have 25 to 30 percent more vitamin C than those picked green and ripened by ethylene gas on the way to market.[17] In short, we are paying more for food of lesser quality.

Energy Waste

Transporting our imported food not only adds to the price of food, it wastes huge amounts of energy. And while trucks use three times the amount of energy per ton per mile as do railroads,[18] rail unloads into Detroit account for only 9 percent of the total and have been decreasing.[19] Energy is wasted not only through transporting imported food that could have been produced in Michigan, but in the distribution of Michigan grown food. As a component of the national food system, we supply other areas of the country with food which is out of season for them. While this practice provides a wide array of food, it can waste energy unnecessarily and needs to be checked.

Local Economy Depressed

Since about 20 percent of the retail food dollar stays with the retailer, $6 billion of our total $7.5 billion food import bill actually leaves the state; that's $16 million leaving the state each day. With $2.4 billion worth of food exports, that's quite an imbalance of trade.[20] In addition, much of what we export is unprocessed and is sold wholesale, so the actual value to Michigan of these exports is considerably less.

The money generated for the state from producing food is represented by economic multipliers. The income multiplier for food manufacturing is substantially higher than that for construction, finance and insurance or business and personal service.[21] Increasing our agricultural production to meet our current processing capacity would generate money and jobs. For example, if we increased our swine production to meet our current slaughter capacity, $800 million would be added to Michigan's economy and 3,000 additional jobs created.[22] The full value and jobs from processed corn and soybean and hard cheese would be captured by the state if we had the processing facilities.

Michigan needs to decrease its costs of transporting in food, and it needs the money and jobs generated from increased agricultural production and in-state processing. Not producing and/or processing over 35 percent of what Michigan residents consume contributes to a depressed economy.

It is clear that producing more of the food that we consume could be quite advantageous for many reasons. But, our ability to do so ultimately depends on our farm situation and the condition of our land base.

Farms

In 1900, Michigan had more than 200,000 farms and about 17.5 million acres of farmland. Today, we have about 72,000 farms on 11.4 million acres. [23] About 9 million acres of the land in farms is cropland, of which approximately 7 million acres is harvested cropland.[24] In the last 30 years, Michigan has lost 36 percent of its farmland. This means that fewer, larger farms are farming fewer acres.

This phenomenon is due to many interrelated factors which affect the economy of farming. Escalating energy and input costs relative to prices farmers receive is one factor.[25] In 1980 net farm income averaged just $7,605 per farm in Michigan.[26] Many producers face fewer marketing opportunities due partly to fewer, larger commodity buyers willing to buy only large volumes. The capital costs associated with expanding the farm operation to supply larger volumes have put many Michigan farmers into a debt spiral. This situation isn't particular to Michigan, but is occurring throughout the nation.

Development

Michigan would need approximately 10 million acres of land to produce 100 percent of the food we consume that is possible to grow in this climate.[27] However, our ability to produce just 35 percent of our consumption is threatened.

Conversion of farmland to non-farm uses may be the most immediate threat to Michigan's productive capability.

The combination of low farm profitability and soaring land values places immense pressure on farmers to sell their land to developers. Between 1974 and 1979, 900,000 acres of farmland were converted to shopping malls, residential and commercial developments and other non-food producing uses.

This loss of 225,000 acres per year has rated us the second worst state in the nation[28] and amounts to losing productive agricultural land ten times the size of Lansing each year. In addition, over 100,000 more acres are isolated each year by leap-frog development, making the land unavailable for farming.[29] This amounts to losing good cropland the size of Detroit each year.

It has been cited that Michigan has about 600,000 acres of land not now in crops that have high potential for conversion to cropland.[30] However, this could offset the land lost to development for only two to three years. After that point, further development would necessarily mean less agricultural production.

Erosion

While conversion of farmland to non-food producing uses is obviously a threat, it is compounded by the fact that our farmland is decreasing in quality also. The USDA, SCS National Erosion Inventory estimates that Michigan's land loses 2.3 tons of soil/acre/year to erosion. On 9,459,000 acres of cropland, that amounts to 21,604,000 tons of soil eroded each year. Put another way, the amount of soil that is eroded from Michigan's cropland each year is enough to bury the city of Lansing with about a foot of soil every two years.[31]

It takes thousands of years to form productive topsoil. Once the plow

layer (top 6 inches) is lost it is virtually irreplaceable. Every year, Michigan loses an equivalent of 22,504 acres of our plow layer.[32] By the year 2000, 427,579 acres would be rendered unsuitable for farming at this rate.

Since each acre-foot of soil contains two inches of water, 8,000 pounds of nitrogen and 2,000 pounds of phosphorus,[33] losing 2.3 tons/acre/year results in a total value lost of $24 million.[34] The $18 million worth of nitrogen lost plus the $6 million worth of phosphorus lost is equivalent to 12 percent of Michigan's 1980 total fertilizer consumption bill.[35] This does not include the value of the lost thousands of gallons of water.

In all, the continuation of erosion and development at current rates could leave Michigan with only about 3 million acres of cropland by the year 2000.[36] That's only 31 percent of our current plus potential cropland. If this happened, even if we devoted all of our farm production to meet in-state demand, we would have no choice but to import at least 70 percent of our food.

OPPORTUNITIES FOR CHANGE

Although the weaknesses of our food system are overwhelming, there is much we can do to strengthen it. Since Michigan is out of the way for major national transportation lines, with the rising cost of transportation Michigan has an advantage to produce more food to meet in-state and regional demand. In all, we would need about 10 million acres to produce all of the food we eat, that our climate permits.[37] Currently we use about 7 million acres and have about 2 million more designated as cropland which is not being used. If all this land were used we could produce about 90 percent of our food. Given Michigan's physical resources, we could not produce the coffee, cocoa, or citrus fruits that we consume. Just to produce all of the meat we eat would require an additional 5 million acres toward meat production. Thus, it is not desirable to limit our goal to complete food self-sufficiency. What we can do is move toward increased self-reliance, and center our efforts around reducing food costs, strengthening our economy, and decrease the vulnerability of our supply. Much can be done by individuals; other issues are best dealt with by collective, business, local or state government actions.

Consumer Actions

* Become more self-reliant: One approach to lessening our personal vulnerability, saving money, and reducing the load our food system must carry, is to garden and preserve more of our own food. According to a recent survey, 54 percent of the households in the Midwest had gardens in 1980.[38] Each garden produced an average of 588 pounds of food, valued at $460 per garden. Using this data we can assume that Michigan has about 1.7 million gardens producing a total of $794 million worth of food. If each of these gardens produced 1,183 pounds

of vegetables, all of Michigan's fresh vegetable needs could be provided. If all the households in Michigan had gardens producing 928 pounds each, all the state's vegetable needs could be met.[39] Of course many households do not have the conventional garden space available, but many do which are not utilizing it. These figures demonstrate the significant contribution gardens could, and already do, make to our food security.

In the Midwest, according to the survey, the average investment in a garden yielding 588 pounds of food was $19 in 1980. Subtracting this investment from the $460 food value per garden means a savings of $441 on the household food bill. That's a 2,320 percent rate of return on investment. For a little more investment and for those that do not have the garden space, vertical growth frames can be easily constructed. Solar growth frames or small greenhouses can be constructed to provide an assortment of fresh vegetables all year round. Small scale fish, rabbit or quail culture is another way for consumers to gain an edge on rising food costs and uncertain supply.

* Participate: The Cooperative Extension Service is set up to provide gardening information to households. This program should be adequately funded for out-reach to people with pertinent information, inexpensive and healthy gardening methods, as well as food preserving and storage information.

Michigan currently has many excellent church and community action groups designed to assist people in obtaining their food needs. Individuals can contribute much for themselves and their community through participating in these groups' efforts. Efforts include maintaining food banks, gleaning fields after mechanical harvesting, gardening information and utilizing vacant lots for community

gardening. Currently, there is also a program implemented by the State of Michigan Office of Services to the Aging to assist in alternative food delivery systems for senior citizens.[40] This has initiated over nine community solar greenhouses in Michigan which are operated by senior citizens to provide food during the off-season. Grass roots activities such as these need to be supported and promoted, but ultimately depend on the participation of the individual who strives for food security.

* Be conscious of diet: Another way we can decrease our dependence on imported food is to become more conscious of what we eat. For example, it takes nine times as much space to produce a pound of beef as it does to produce a pound of chicken.[41] Increased poultry consumption could free up additional cropland for other crops, or at least decrease our dependence on imported red meat. Trends such as this are already occurring. A 1979 survey found that 15 to 20 percent of households interviewed had reduced their use of bacon, sausage, hot dogs and luncheon meats, eggs, beef, and fresh pork, while increasing their use of poultry and fish during the past three years; 25 percent had increased their fruit and vegetable consumption. The reasons cited were concern about fat, cholesterol, salt and sugar intake.[42] The accompanying food import chart reveals the production and importation of each food commodity. Utilizing this, people can alter their diet and consume more nutritious food produced in the state while decreasing the state's economic burden.

Collective Action

* Promote consumption of locally produced food: Demand for in-state produced food is currently being promoted through the "Good Things Growing in Michigan" campaign by the Michigan Department of Agriculture. This promotion campaign should be extended to all facets of the food system, particularily with labels

identifying Michigan produced food. The demand by individuals for state produced food is only the first step. The myriad of marketing channels through which food travels from the field to the table is complex.

The simplest way to obtain state produced food is through direct marketing. This includes roadside stands, house to house delivery, pick-your-own operations, and farm stores or markets. A report by the USDA found that in 1978, 36 percent of Michigan farmers sold commoditites through direct marketing, with a sales value of over $75 million.[43] The benefits of direct marketing include increased income for the farmer, fresher and cheaper food for the consumer, and a stronger link between producer and consumer. USDA studies of direct marketing in Colorado showed that local farmers received 44 percent higher gross returns from direct marketing than if they had sold through wholesale channels, while consumers paid an average 28 percent less than supermarket prices.[44] Other advantages of direct marketing include opportunities for consumers to buy food in bulk for home canning and preserving for off season use, and economic benefits for local merchants and banks. Michigan State University Cooperative Extension Service has initiated successful farmers' markets through their direct marketing program and have helped communities seeking assistance in starting municipal markets. In addition, the vast network of consumer food cooperatives in Michigan has provided Michigan farmers with an outlet for a variety of products, while keeping prices to consumers at a minimum. Legislative, community and business efforts to increase direct marketing opportunities, and support a strong consumer food cooperative network, could help Michigan's food situation substantially.

There are many other options and strategies for improving the marketing

system to strengthen regional agriculture and Michigan's food system. Grading standards should be revised to reflect nutritional status, product end uses and maturity and eating quality rather than external appearance. The establishment of regional storage facilities to grade, pack and distribute the output of small local producers to provide large buyers with the volumes and specifications they demand could be instituted. These centers could be started with public funds and become self supporting through fees paid by producers. Another option that could be implemented is state purchase of Michigan grown crops. If locally produced foods were purchased by Michigan's hospitals, schools, prisons and other institutions, expanded markets would be provided to our farmers while decreasing our transportation costs. Included in this area is the option of mandating the use of public farmlands for the production of crops for local consumption.

Along with incentives for marketing locally produced food, efforts are needed to provide a profitable business climate for processors in the state. There are efforts underway to study the feasibility of a soybean processing plant in Michigan. This action is also needed for hard cheese processing. Another option is encouraging on-farm processing, as well as research on energy efficient packing methods.

* Help out the producers: Increasing the direct marketing and in-state processing would help the economic situation of agricultural producers by providing new markets. Other actions are needed as well to assist new farmers. Currently the average age of farmers is over 50,[45] and because of the precarious economic situation many young "would be" farmers are opting to leave food production for non-farm employment opportunities. Some options might

include providing guaranteed state loans to beginning farmers, with deferred or reduced payments for a limited time. Also the development of "entry packages" for new farmers that would include help in obtaining the needed quantities of land, capital, agronomic advice along with managerial and organizational assistance could increase opportunities for beginning farmers. Currently there are community development group actions as well as state and federal initiated programs to provide assistance to producers. Expanding these efforts to attract new farmers would benefit the food security of the state.

* Curb Development: Perhaps the area of most immediate concern requiring collective action is the protection of our agricultural land base. The continuation of our current annual rates of erosion and development will make importing more and more food a necessity in the future unless we act now. Making an inventory and mapping all prime and unique farmland in Michigan would be a good start in addressing these problems. Such an inventory would include identification of all agricultural lands, their potential, current status and likely availability for new farmers or farming ventures.

The next step of actually protecting farmland is one that is complex and which requires a variety of responses. Michigan has already begun to address the problem of development that threatens our farmland base. Michigan's Farmland and Open Space Preservation Program (Public Act 116) helps to protect farmland from development by offering a limited income tax credit to farmers in return for their agreement not to develop or change the use of their land for varying lengths of time. While currently 6,000 farmers with 1.4 million acres of farmland have enrolled in this program, agreeing not to let their land be developed for an average of about 20 years, more participation needs to be encouraged,[46] especially near urban growth areas where farmland needs the

most protection. It is on the urban fringe, where property values are the highest, that farms are lost to development at the highest rates.

Perhaps a use-value property tax assessment system, whereby farmland is taxed based on the value of its agricultural productivity rather than its value as residential or commercial property could ease some of the high tax burden farmers currently must bear.

The recently passed "Right-to-Farm" Bill is another effort to ease the pressures of urban sprawl by protecting Michigan farmers from nuisance suits brought by suburban neighbors, as long as the farmers follow "accepted" farming practices.[47]

Possibly the best long term solution of the development problem is to help farmers close to urban centers become more profitable by increasing their contribution to the local food supply. This would link their existence to the health of the community to a greater extent, and promote heightened awareness by both producers and consumers of each other's situations.

Other strategies that could be employed include the institution of capital gains tax on farmland sales and speculation, the establishment of property tax at the time of sale of farmland that will stay the same until the property is sold again, and the institution of a heavy tax on profits made on development of previously agricultural land. Another approach might be to set up state chartered corporations with the authority to buy farmland for sale and resell it to farmers willing to commit themselves to commercial production. This could be linked with designating agricultural preserves composed of at least 70 percent of the prime farmland within the borders of each municipality.

* Decrease Erosion: The soil erosion problem in Michigan could be

publicized to reveal its real cost to both farmers and consumers. As energy and raw material prices continue to escalate, many farmers may think twice about the $24 million worth of fertilizer lost year to erosion. Substitution of chemical inputs for good topsoil will become increasingly expensive. At a recent Midwestern Governor's Conference a "Soil Depletion Tax" on the region's food exports was proposed to help compensate for the loss of natural resources.[48]

Other possiblities include incentive packages at state and federal levels to encourage good conservation and land management principles, the linking of state purchase of farm commodities to soil conservation programs, and increased public awareness of the need to support sound soil conservation practices. Specific tax incentives could be implemented for conservation techniques such as contour and minimum tillage, strip cropping, crop rotation and the use of cover crops.

* Conserve Energy and Natural Resources: Actions to conserve energy and natural resources could also contribute greatly to the sustainability of Michigan's food system. Increasing local fertilizer production is one possibility. In 1980, 645,650 tons of primary fertilizer nutrients were applied by farmers.[49] Much of this was imported to Michigan from distant areas. Meanwhile, each year the livestock, poultry and humans in Michigan produce the equivalent of nearly one quarter of the fertilizer needed by our farmers.[50] Establishing an Agricultural Waste Council in the Michigan Department of Agriculture to develop desirable legislation and other measures to facilitate the recycling of these organic wastes is needed.

One excellent example of recycling wastes to boost agricultural productivity

in Michigan is the Muskegon County Land Treatment System. This System uses the effluent waste from the county for irrigation water on 5,000 acres of corn. In 1976 a yield of 81 bushels per acre (compared to a county average of 45 to 50 bushels per acre) brought $1 million in revenue.[51] Besides the gains of increased crop production, and the creation of revenue, this System has brought about significant improvements in the water quality of nearby lakes and streams.

Other options for conserving energy and natural resources in Michigan's food system include developing incentives for water conservation measures, such as investment tax credits for drip irrigation equipment (as opposed to more wasteful types), developing incentives for increasing the recycling of crop residues from food processing operations for energy and fertilizer for farm soils, promotion of energy production from agricultural lands in a way consistent with soil and water conservation principles, and providing investment credits for construction of energy conserving barns, and other conservation projects as well as the current credits provided for greenhouses and other solar construction.

A significant contribution to our understanding of energy use in Michigan's food system has already been made. The Farm Energy Audit Study conducted by Michigan State University has collected detailed data on energy used for numerous purposes in a variety of farm enterprises.[52] Using the results of this study, the comparative energy efficiency of various agriculture systems can be determined and conservation programs can be developed.

On-farm energy conservation programs could be linked with research and

and programs to reduce soil erosion and examine more sustainable farming methods. The excellent work in Integrated Pest Management by the Entomology Department at Michigan State University is an example of this type of research and development. Granting additional funds to Michigan State University or orienting existing research funds in these directions could help Michigan farmers cope with rising energy prices and help assure a plentiful long-term food supply. Such organizations as the Michigan Agricultural Experiment Station, The Kellogg Biological Station, and the Cooperative Extension Service should be encouraged to expand along these lines.

SUMMARY OF RECOMMENDATIONS

It is not feasible to trace out all of our options in this report. The point is that we do have opportunities to revitalize our food system. The Cornucopia Project has a task force engaged in making a comprehensive inventory of programs that other states, countries, or research organizations have either instituted or proposed to deal with problems in the food system. The following outline summarizes the general actions Michigan must take to effectively deal with its food problems.

A. State Plan for Michigan's Food System

This plan should incorporate measures which will realize the following broad policy objectives:

1. Inventory, map, and protect all remaining prime farmland from development and speculation.
2. Preserve our soil by instituting widespread and effective soil conservation programs.
3. Develop incentives for farmers to produce a greater diversity of crops for local consumption.
4. Conserve energy and natural resources.
5. Orient state agricultural research to focus more on sustainable farming methods and local food production.
6. Preserve and strengthen the family farm.
7. Develop regional and community food plans.

B. Emergency State Food Plan:

This plan should incorporate measures which will deal with the following contingencies:

1. A complete oil cutoff to the United States from all OPEC countries.

2. A multi-year drought in Michigan's present-day major food supply areas.

3. A near shutdown for one to four weeks of the U.S. trucking and rail system.

4. A widespread labor dispute in Michigan's present-day major food supply centers that could cutoff the flow of food into Michigan.

5. An extraordinary leap in food prices so that only the wealthiest people in Michigan could afford food.

Creative planning and action to take advantage of our opportunities could guide Michigan to increased self-reliance and economic viability, enhance the nutritional quality of the food we eat, decrease our vulnerability in times of national and international economic stress, and make Michigan's food system more sustainable. The problems we face are real and growing and if left unchecked, our food system may crash. If Michigan is truly concerned about the condition of its future food system, the state must be willing to develop and implement a realistic plan of action. This will take time and money and the involvement of everyone. The longer we wait, the fewer our opportunities. The time to begin is now.

Footnotes

1. An Agricultural Presentation Strategy for Michigan, Report to Governor W. G. Milliken by The Community Development Cabinet (Lansing, MI, November, 1980) p.i.

2. Proceedings of The Michigan Governor's Conference on Agriculture, (Lansing, MI, April 1-2, 1981) Conference speech by Richard Lyng, p. 10.

3. Ibid, Remarks by Governor Milliken, p. 8.

4. Karl T. Wright and John N. Ferris, Michigan Agriculture, Going into the Eighties, Michigan State University Cooperative Extension Service, APR 25, March, 1981, p. 1.

5. Neil Sampson, "The Ethical Dimension of Farmland Protection," Farmland, Food and the Future (Ankeny: Soil Conservation Society of America, 1979) p. 93.

6. "Farmers Face a Credit Squeeze," New York Times, 21 March, 1980. Pp. D1, D5.

7. Thomas C. Edens and Herman E. Koenig, "Agroecosystem Management in a Resource Limited World," American Institute of Bio Sciences, Vol. 30, No. 10, 1980, Michigan Agricultural Experiment Station Journal Article No. 9534.

8. Michigan Grain and Agri Dealers Association, telephone conversation, August, 1981.

9. Michigan Food Imports: as determined by Food Production and Consumption by Weight and Retail Value Chart, (Emmaus, PA, Rodale Press 1982). 15,149,838,890 lbs of food consumed in Michigan x 65% imported = 9,847,394,700 lbs imported ÷ 40,000 lbs (average truckload weight) ÷ 52 weeks = 4,734 truckloads per week.

10. U.S. Department of Agriculture, Fresh Fruit and Vegetable Unloads in Midwestern Cities 1980, Agricultural Marketing Service, Fruit and Vegetable Division, 1981.

11. Chatam Supermarkets, Detroit, Michigan and Kroger Supermarkets, Lansing, Michigan, Telephone conversations, Summer 1981.

12. Michigan Food Imports Chart, op. cit., $7.4 billion worth of food imported ÷ 9,258,344 people in Michigan (1981) = $799.28 per person.

13. U.S. Department of Agriculture, 1980 Handbook of Agricultural Charts, Agricultural Handbook #574, Chart 90, p. 39. Transportation costs are 8% of farm food marketing bill; .08 x $7.4 billion import food bill (Michigan Food Imports Chart) = $592 million.

14. U.S. Department of Agriculture, Fresh Fruit and Vegetable Unloads in in Midwestern Cities 1980, op. cit.

15. U.S. Department of Agriculture, "Fruit and Vegetable Truck Rate Report for July, 1981," Vol. 3, No. 7.

16. A Matter of Justice: A Report on Hunger and Malnutrition, State of Michigan, prepared by The House Committee on Public Health, Health Project (Lansing, Michigan, 1975) p. 1.

17. Robert Harris and Endel Karmas, Nutritional Evaluation of Food Processing (Westport, CT: The AVI Publishing Co., Inc. 1975) p.103.

18. Proceedings of The Northeast Agricultural Leadership Assembly, Vol II (Cherry Hill, NJ, March 20-22, 1979). Speech by Walter Vegara, "Toward Optimization of Energy Consumption in Food Distribution," p. 257.

19. U.S. Department of Agriculture, Fresh Fruit and Vegetable Unloads in Midwestern Cities 1980, op. cit.

20. Michigan Food Imports Chart, op. cit.

21. David L. Call, Director of New York State Cooperative Extension, "The Role of Agriculture in the Economy of New York State," a summary of remarks presented at the Agricultural Forums, April, 1977.

22. Proceedings of The Michigan Governor's Conference on Agriculture, op. cit., The Livestock and Poultry Committee, p. 99.

23. Michigan Agricultural Statistics 1981. Michigan Agricultural Reporting Service, Michigan Department of Agriculture (Lansing, MI 1981) p. 5.

24. Karl T. Wright and John N. Ferris, op. cit., p. 2.

25. Ibid. p. 9.

26 Michigan Agricultural Statistics 1981, op. cit. p. 10.

27. Michigan Food Imports Chart, op. cit.

28. Aglands Exchange, National Association of Counties Research Foundation, Washington, D.C., Vol.1, No. 3, February/March, 1980.

29. An Agricultural Presentation Strategy for Michigan, op. cit.

30. U.S. Department of Agriculture Soil Conservation Service, "National Resources Inventory," 1977.

31. 21,604,000 tons of soil eroded/year ÷ 1920.5 tons/acre foot = 11,249.154 acre feet lost/year ÷ 21,376 acres (Area of Lansing = 33.4 sq. miles x 640 acres/sq mile) = .5263 foot of soil to cover the area of Lansing/ year.

32. 21,604,000 tons of soil eroded each year ÷ 160 tons/inch/acre = 135,025 acre inches/year ÷ 6 inches = 22,504.17 acre 6 inches deep lost/year.

33. W. E. Larson, "Soils and Soil Conservation: The Natural Resource Base," Contribution of Science and Education Administration Agricultural Research, North Central Region, USDA, Paper No. 11383, Scientific Journal Series. (Paper prepared for the Soil and Water Resources Research Priorities Workshop, Madison, Wisconsin, February 23-27, 1981) p. 9.

34. 11,249.154 acre feet lost/year x 8,000 lbs N/acre foot 89,993,232 lbs lost/year x $.199/lb N = $17,908,653. 11,249,154 acre feet lost/year x 2,000 lbs P/acre foot = 22,498,308 lbs P lost/year x $ .263/lb P = $5,918,033. Prices based on figures given in Michigan Agricultural Statistics 1981, op. cit., p. 16.

35. Michigan Agricultural Statistics 1981, op. cit. Value of fertilizer used in Michigan = $204.7 million, $24 million worth of fertilizer lost in eroded soil ÷ $204.7 million = 11.7% of total.

36. 22,504 plowlayer acres lost to erosion/year + 325,000 acres lost to development/year = 347,504 acres lost/year in total x 19 years until year 2000 = 6,602,576 lost. 9.6 million current and high potential cropland - 6.6 million = 3 million acres left by year 2000.

37. Michigan Food Imports, op. cit.

38. Gardens for All, National Gardening Survey 1980-1981, prepared by The Gallup Organization, Inc. for the National Association for Gardening, Burlington, Vermont.

39. Michigan Food Imports, op. cit. 2,964,973,900 lbs of fresh vegetables consumed in Michigan ÷ 3,195,015 households = 928 lbs/household.

40. David H. Houseman, Office of Services to the Aging, Lansing, MI, Alternative Food Delivery Systems Project. Paper submitted to the Great Lakes Solar Greenhouse Conference III, (Chippewa Nature Center, MI, Oct. 17, 1980).

41. Michigan Food Imports, op. cit. Michigan beef production = 170,252,760 lbs on 1,093,328 acres; Chicken production = 19,717,920 lbs on 14,069.77 acres. It takes .006422 acres/lb beef and .000714 acres/lb chicken.

42. Judy Lea Jones and Jon Weimer, "Health-Related Food Choices," Family Economics Review, Summer, 1981, pp. 16-18.

43. U.S. Department of Agriculture, Farmer-to-Consumer Direct Marketing in Six States, Agriculture Information Bulletin No. 436, prepared for the National Economics Division; Economics, Statistics and Cooperative Service, by Peter L. Henderson and Harold R. Lingstrom (Washington, D.C.: Government Printing Office).

44. "Direct Marketing Proves Its Worth," The New Farm, March/April 1981, p. 51.

45. U.S. Department of Agriculture, Economics, Statistics and Cooperative Services, Structure Issues of American Agriculture, Agricultural Economic Report 438, November, 1979, p. 116.

46. An Agricultural Preservation Strategy for Michigan, op. cit., p. 17.

47. "Michigan Right-To-Farm Act Now In Effect," The Great Lakes Fruit Growers News, July, 1981, p. 19.

48. Midwestern Governors' Conference, "Policy Statement on Soil Depletion Tax," (Milwaukee, Wisconsin, August 30- September 1, 1981).

49. Michigan Agricultural Statistics, op. cit., p. 9.

50. Michael Bewick, ed. Handbook of Organic Waste Conversion (New York: Van Nostrand Reinhold Company, 1980), pp. 73-80, and U.S. Department of Commerce, Estimating U.S. Livestock and Poultry Manure and Nutrient Production, Economics, Statistics, and Cooperative Service, 1978, p. 9.

51. U.S. Environmental Protection Agency, "Wastewater: Is Muskegon County's Solution Your Solution?" 1976 update. EPA Region V publication, Chicago, Illinois, 1976.

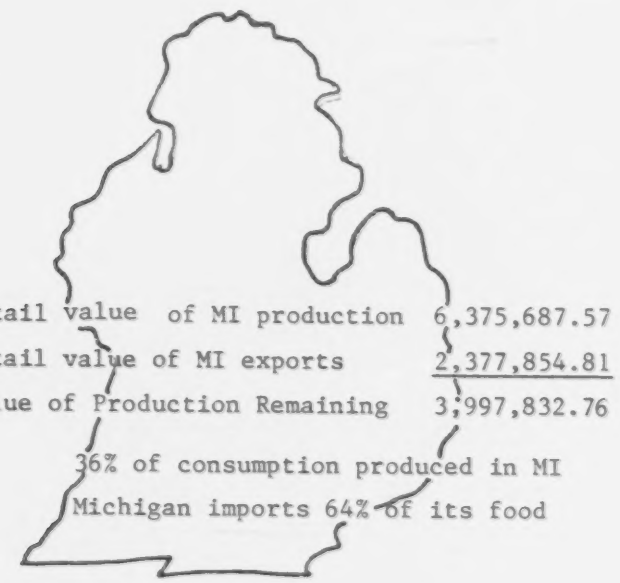
52. The Michigan Farm Energy Audit Study, Michigan State University, Cooperative Extension Service (East Lansing, Michigan, 1981).

APPENDIX

MICHIGAN FOOD IMPORTS

Despite a highly diversified agriculture system that produces nearly fifty commercial crops each year, 64 percent of the food consumed by Michigan residents is imported from other states. Although Michigan produces important crops such as blueberries, dried beans, apples, carrots, strawberries and fresh sweet corn, each person in Michigan pays over $800 every year for food imported from as far as California, Washington, and Texas. Transportation costs for this imported food account for $600 million of Michigan's food bill.

However, given Michigan's climate, terrains, and soils, in-state production of many foods could be increased. In addition to producing more food locally, there are other ways to increase Michigan's food self-reliance, including expanding direct marketing, encouraging in-state food processing facilities, and preserving farmland. By acting on these and other issues, Michigan residents can begin to build a sustainable food system.


Retail value of MI production 6,375,687.57
Retail value of MI exports 2,377,854.81
Value of Production Remaining 3,997,832.76
36% of consumption produced in MI
Michigan imports 64% of its food

MICHIGAN STATE FOOD IMPORTS

As determined by food production and consumption by weight and retail value

	PRODUCTION		CONSUMPTION						
	Retail Weight[a] (1,000 lbs)	Retail Value[b] ($1,000) (1981 $)	Retail Weight[c] (1,000 lbs)	Retail Value ($1,000) (1981 $)	% Import[d]	Retail Value[f] of Import ($1,000)	% Export[g]	Retail Value[h] of Export ($1,000)	Acres Required[i] to Produce 100% of MI Consumption
Meats[j]									
Beef	170,252.76	379,663.65	788,900.	1,759,247.	78.4	1,379,249.6			5,066,134.2
Veal	5,164.52	13,324.45	16,479.85	42,518.02	68.7	29,209.88			[k]
Lamb & Mutton	4,343.41	7,600.97	12,776.52	22,358.9	66.	14,756.88			121,393.15
Pork	203,340.91	333,479.09	635,490.	1,042,203.6	68.	708,698.45			1,360,024.2
Lard (pork)	20,784.42	16,627.54	24,071.69	19,257.35	13.7	2,638.25			[l]
Poultry									
Chicken	19,717.92	22,872.79	476,800.	553,388.	95.9	530,411.39			340,222.26
Eggs	185,159.26	87,024.85	331,450.	155,781.5	44.1	68,699.64			223,630.72
Turkey	29,783.	29,485.17	93,509.27	92,574.18	68.2	63,135.59			91,217.2
Fish									
Fresh water	3,500.[m]	11,200.	62,030.91	198,498.9	94.4	187,382.96			
Salt water	NA	0.	58,327.57	200,646.83	100.	200,646.83			
Dairy									
Butter	36,709.	68,278.74	42,588.38	79,214.39	13.8	10,931.59			
Cheese	35,343.	106,029.	162,946.85	408,840.55	78.3	382,762.15			
Cond/Evaporated Skim	68,752.	41,251.2	31,478.37	18,887.02			54.2	22,358.15	
Cottage Cheese	66,595.	107,217.95	42,588.38	68,567.30			36.1	38,705.68	
Cream[n]	121,520.68	136,103.16	54,624.23	61,179.14			55.	74,856.74	
Fluid Milk[o]	3,358,108.1	906,689.16	2,560,900.	691,443.			23.7	214,885.33	
Ice Cream	164,866.	194,541.88	162,021.02	191,184.8			1.7	3,307.21	
Ice Milk	47,808.	35,856.	69,437.58	52,078.19	31.2	16,248.39			
Sherbert	9,864.	7,398.	12,035.85	9,026.89	18.	1,624.84			
Non Fat Dry	66,214.	77,470.38	19,442.52	22,747.75			70.6	54,694.09	
Other[p]	33,732.80	55,321.80	78,695.92	129,061.32	57.1	73,694.01			
Total	4,009,512.58	1,736,157.3	3,236,759.10	1,812,230.35	26.8	485,260.98	23.5	408,807.2	1,935,278.8[a]
Exported Grain[r]									
Corn	8,263,716.4	471,858.21	0.	0.			100.	471,858.21	
Soybean Meal	454,159.64	55,634.56	0.	0.			100.	55,634.56	
Grains[s]									
Barley	774.43	302.03	11,110.01	4,332.91	93.	4,029.60			7,230.37
Corn: Cereal, Flour, Meal			131,468.48	52,318.9					
Syrup, Sugar, Starch			464,768.87	306,747.45					
Total[t]	1,348,620.	77,006.20	596,237.35	359,066.35	100.	359,066.35	100.	77,006.20	172,571.22
Oats	29,793.02	20,855.12	29,626.70	20,738.69			.6	125.13	26,650.39
Popcorn	18,980.	9,110.4	22,220.03	10,665.61	14.6	1,557.18			8,080.01
Rice	0.	0.	85,176.77	74,955.56	100.	74,955.56			NA
Rye	3,319.14	929.36	7,406.68	2,073.87	55.2	2,073.87			6,888.65
Soybeans: Flour, Grits	35,750.4	26,097.79	18,516.69	13,517.18			48.2	12,579.14	9,840.93
Wheat, Soft: Flour, Cereal[u]	1,597,805.9	447,385.65	295,804.09	82,825.15			81.5	364,619.3	130,287.21
Hard	0.	0.	839,731.8	235,124.9	100.	235,124.9			396,860.73

MICHIGAN STATE FOOD IMPORTS (Continued)

As determined by food production and consumption by weight and retail value

	PRODUCTION		CONSUMPTION						
	Retail Weight[a] (1,000 lbs)	Retail Value[b] ($1,000) (1981 $)	Retail Weight (1,000 lbs)	Retail Value[d] ($1,000) (1981 $)	% Import[e]	Retail Value[f] of Import ($1,000)	% Export[g]	Retail Value[h] of Export ($1,000)	Acres Required[i] to Produce 100% of MI Consumption
Veg. Oil (Corn, Soy)[v]									
Margerine			106,470.96	88,370.90					
Oils			213,867.75	158,262.14					
Shortening			174,982.7	101,489.97					
Total	362,232.42	42,111.94	495,321.41	348,123.	100.	348,123.	100.	42,111.94	v
Vegetables									
Artichokes: Fresh	NA	0.	3,703.34	2,925.64	100.	2,925.64			
Asparagus: Fresh	6,370.00[+]	8,854.30	2,777.50	3,860.73			56.4	4,993.83	
Canned			2,777.50	5,221.71					6,329.45
Frozen			704.67	1,481.34					
Total Processed	16,440.00	23,609.93	3,518.17	6,703.05			70.7	16,701.66	
Broccoli: Fresh	6.41[+]	6.41	12,035.85	12,035.85	99.9	28,899.69			
Frozen	NC		12,683.93	12,683.93					4,817.58
Cabbage: Fresh	42,780.	11,430.82[b]	74,992.59	21,072.92	56.1	14,579.87			
Sauerkraut	NC		12,035.85	4,934.70					6,363.66
Carrots: Fresh	109,513.	398,662.73	54,624.23	19,883.22			37.9	151,212.77	
Canned			4,629.17	1,990.54					3,312.20
Frozen			10,091.60	7,366.86					
Total Processed	45,960.	17,532.33	14,720.77	9,357.40			46.6	61,429.23	
Cauliflower: Fresh	4,600.	4,445.21[b]	11,110.01	11,332.21	74.1	3,474.43			
Frozen	NC		4,629.17	5,786.47					3,544.62
Celery: Fresh	128,991.[+]	70,816.06	64,808.41	35,579.82			49.8	35,238.07	
Corn, Sweet: Fresh	70,932.	16,016.45[b]	62,956.74	19,831.37	66.9	32,299.56			1,449.85
Canned	NC		50,920.89	22,405.19					32,032.83
Frozen[w]	NC		9,536.09	6,007.74					
Cucumbers: Fresh	19,228.00	10,017.79	36,107.54	18,812.03	46.8	8,794.62			3,282.50
Pickles	210,160.00	134,502.4	79,621.76	37,912.70			71.81	69,358.53	5,327.21
Dry Edible Beans	744,800.	464,755.20	59,253.40	369,753.32			92.	427,760.69	
Dry Field Peas	0.	0.	3,703.34	1,555.40	100.	1,555.40			4,455.14
Eggplant	121.50[+]	95.99	5,555.01	4,388.46	97.8	4,292.35			1,424.36
Escarole	NC		6,480.84	3,175.61	100.	3,175.61			277.75
Garlic	NC		8,332.51	66,660.07	100.	66,660.07			360.05
Lettuce	23,436.00	13,299.93	224,051.92	127,149.46	89.5	113,849.63			347.19
Mushrooms: Fresh, Canned[x]	11,000.00	20,350.00	24,997.53	46,120.44	56.0	25,827.45			10,669.14
									NA
Onions: Fresh	169,200.	194,521.63[b]	102,767.62	53,490.55	49.2	189,026.67			
Processed	NC		31,015.45	330,397.89					13,332.02
Peppers	11,592.	18,338.54	29,626.70	46,869.44	57.5	26,935.87			4,003.61

MICHIGAN STATE FOOD IMPORTS (Continued)

As determined by food production and consumption by weight and retail value

	PRODUCTION		CONSUMPTION						
	Retail Weight[a] (1,000 lbs)	Retail Value[b] ($1,000) (1981 $)	Retail Weight (1,000 lbs)	Retail Value[d] ($1,000) (1981 $)	% Import[e]	Retail Value[f] of Import ($1,000)	% Export[g]	Retail Value[h] of Export ($1,000)	Acres Required[i] to Produce 100% of MI Consumption
Potatoes: Fresh	814,368.	232,257.75[b]	469,398.04	123,921.08	30.1	98,425.91			51,326.63
Canned	NC		12,961.68	4,536.59					
Chips, Flakes, Other	NC		220,348.59	198,538.71					
Pumpkin/Squash: Canned	2,426.77	800.83	5,555.01	1,833.15	83.9	1,538.02			614.45
Snap Beans: Fresh	8,742.00	6,031.98	12,035.85	8,304.73	27.4	2,273.01			3,761.20
Canned			55,550.06	20,553.52					
Frozen			11,387.76	8,768.58					
Total Processed	76,720.	41,601.61	66,937.82	29,322.10			30.93	12,867.38	9,462.36
Spinach: Fresh	NC		3,703.34	2,370.14	100.	2,370.14			336.67
Processed	NC		14,165.27	8,247.33					
Sweet Potatoes: Fresh	23.40[+]	10.41[b]	37,033.38	14,813.35	99.9	22,338.47			2,230.73
Canned	NC		10,184.18	7,536.29					
Tomatoes: Fresh	31,790.	29,564.7	99,990.12	92,990.81	68.2	63,429.03			9,090.01
Total Processed	147,360.00	26,537.41	221,274.42	117,189.16	78.2	91,677.08			27,547.29
Minor Veg.[y] Fresh	5,449.19	1,775.89[b]	20,368.36	10,184.18	93.4	25,254.00			
Canned	NC		42,588.38	7,611.47					
Frozen	NC		23,516.19	9,242.90					
Fruits									
Apples: Fresh	225,600.00[z]	135,811.2	153,688.51	92,520.48			31.9	43,323.77	12,674.03
Canned	163,000.	58,746.64	23,145.86	15,507.73			73.6	43,237.53	
Frozen	57,000.	35,497.01	3,147.84	3,273.75			90.8	32,231.29	
Juice, Cider, Other	225,000.	6,600.	87,121.02	37,976.97			44.18	2,915.88	
Apricots: Processed	107.45[+]	86.82	4,814.34	5,093.02	98.3	5,006.44			
Avocados	NA		11,110.01	8,110.31	100.	8,110.31			NA
Bananas	NA		198,128.56	78,062.65	100.	78,062.65			
Berries: Fresh	38,869.80	56,703.26[b]	2,036.84	2,036.84			89.89	5,159.02	901.10
Canned	NC		925.83	1,259.14					
Frozen	NC		1,203.59	2,443.28					
Cranberries: Fresh	0.	0.	1,851.67	925.84	100.	4,110.71			359.90
Canned			7,406.69	3,184.87					
Strawberries: Fresh	12,604.00	10,259.66	16,665.02	13,565.33	24.4	3,309.94			4,034.36
Processed	3,900.	5,433.71	10,739.68	13,317.20	59.2	7,883.78			
Cherries, Sweet: Fresh	3,680.	5,262.40	370.33	529.58			90.7	4,773.00	1,281.81
Processed[aa]	54,000.	35,410.50	7,406.68	4,856.93			85.87	30,346.80	
Cherries, Tart: Fresh, Other[bb]	5,520.[+]	1,529.04	5,520.	1,529.04					1,008.47
Canned	52,000.[+]	50,440.	462.92	449.03			99.1	444.99	
Frozen	91,000.	68,250.	4,166.26	3,124.69			94.9	2,965.33	
Citrus: Fresh	NA	0.	222,200.26	145,096.77	100.	333,652.31			
Processed			217,941.52	188,555.54					

MICHIGAN STATE FOOD IMPORTS (Continued)

As determined by food production and consumption by weight and retail value

	PRODUCTION		CONSUMPTION						
	Retail Weight[a] (1,000 lbs)	Retail Value[b] ($1,000) (1981 $)	Retail Weight (1,000 lbs)	Retail Value[d] ($1,000) (1981 $)	% Import[e]	Retail Value[f] of Import ($1,000)	% Export[g]	Retail Value[h] of Export ($1,000)	Acres Required[i] to Produce 100% of MI Consumption
Dates & Figs: Dried	NA	0.	4,166.26	6,624.35	100.	6,624.35			
Grapes: Fresh	3,094.	3,867.50	28,700.87	35,876.08	89.2	65,520.83			130,036.26
Juice, Other[cc]	89,000.	63,535.85	23,516.19	37,577.77	90.1	33,838.78			
Melons: Cantaloup	16,560.00	7,783.20	75,918.42	35,681.66	78.2	27,898.46			6,326.54
Watermelon	20.78	3.74	104,619.39	18,831.47	99.9	18,827.73			1,046.19
Olives	NA	0.	11,110.01	27,775.03	100.	27,775.03			
Peaches/Nectarines: Fresh	37,642.62	26,885.86	50,920.89	35,644.62	63.	44,313.78			12,715.41
Processed			49,254.39	34,694.72					
Pears: Fresh	19,000.	10,917.4	23,145.86	15,067.96	53.	12,362.99			5,657.57
Processed			16,757.60	8,258.44					
Pineapple/Papaya: Fresh	NA	0.	12,961.68	6,480.84	100.	59,440.17			
Processed			66,199.16	52,959.33					
Prunes/Plums: Fresh	10,640.-	6,277.60	15,739.19	9,286.12	32.4	3,008.70			7,122.47
Canned, Juice			9,443.51	5,938.30					
Frozen			1,296.17	1,451.71					
Dried			4,258.84	5,749.43					
Total Processed	13,800.00-	12,059.82	14,998.52	13,139.44	47.4	6,230.72			
Nuts									
Tree Nuts	16.80	137.26	16,665.02	36,153.21	99.9	136,017.06			208,312.74
Peanuts, Other	0.	0.	70,363.41	74,298.21	100.	74,298.21			
Sweets									
Honey	4,386.	6,579.00	12,035.85	18,053.77	63.6	11,474.98			
Sugar	573,333.33[dd]	229,333.33	843,435.14	337,374.06	32.	107,959.70			142,735.18
Cane Syrup/Molasses	0.	0.	3,703.34	4,814.34	100.	4,814.34			
Maple Syrup	1,001.00	2,042.04	925.83	1,888.69			7.51	153.36	
Spices & Herbs[ee]	107.00	1,671.34	14,813.35	231,384.53	99.3	229,718.56			
Coffee, Tea, Cocoa	NA	0.	110,174.29	335,466.83	100.	335,466.83			
TOTALS	21,169,602.18	6,375,687.51	12,954,192.30	11,085,905.93		7,170,350.79		2,377,854.81	10,636,220.57

FOOTNOTES FOR IMPORTS CHART:

NC Not Collected

NA Not considered applicable to Michigan's physical capabilities

\+ 1980 production for this commodity is at least 20% above the 1978,'79,'80 production average.

\- 1980 production for this commodity is at least 20% below the 1978,'79,'80 production average.

a Production weights obtained from: Michigan Agricultural Reporting Service, Michigan Agricultural Statistics, July 1981; USDA Crop Reporting Board, Dairy Products, Annual Summary, 1980; Michigan Department of Agriculture, Michigan Fruit and Vegetable Report, 1980 from Benton Harbor Fruit Market; and converted to retail weight where necessary using USDA Statistical Bulletin No. 616, Conversion Factors and Weights and Measures, and USDA Livestock and Meat Situation, August, 1978. Processed fruit and vegetable figures represent fresh farm weights that are grown for processing utilization.

b Retail value derived using prices supplied by: U.S. Department of Labor, Bureau of Labor Statistics, Historical Average Retail Food Prices for the North Central Region, 1981; Meijers, Krogers, and Shop Rite supermarkets of Lansing, Michigan; and Giant Supermarket of Midland, Michigan. Prices of various brands, cuts, etc. were averaged for each commodity's retail value. Specific data was not available for the processed fruit and vegetable utilizations. However, the processing potential was found to exist in Michigan. The production value for these are weighted according to their corresponding consumption %'s, so that the Total Production Retail Value can be compared more accurately with the Total Consumption Retail Value. The weighted values are included with The Processed Production Value for the commodity, or included with the Fresh Production Value where processed production was NC.

c Derived using per capita consumption figures from USDA Statistical Bulletin No. 656, Food Consumption, Prices and Expenditures, 1980; and Michigan's 1980 population of 9,258,344 persons.

e Shows the % of the food commodity that we consume which was not produced in Michigan. Computed using the difference between consumption and production (using corresponding Retail Values or Fresh Equivalent Weights) taken as a % of consumption.

f Computed by multiplying the % Import by the Retail Value of Consumption.

g Shows the % of the food commodity that Michigan produces in excess of what Michigan consumes. Computed using the difference between Production and Consumption (using corresponding Retail Values or Fresh Equivalent Weights), taken as a % of production.

h Computed by multiplying the % Export by the Retail Value of Production.

i Derived using acres harvested and yields/acre from Michigan Agricultural Statistics, July 1981; Vegetable and Fruit yields/acre not published supplied by Dr. Zanstra, Michigan State University, Department of Horticulture. Meat, Poultry and Dairy figures represent acres used/needed based on rations of grains, soybean meal, and hav and pasture where applicable; estimates obtained from Michigan State Department of Animal Science. Tree Fruits and Nuts yield/acre derived using total production/total acres of bearing trees.

j Production and consumption weights include weights of edible offals.

k Veal is a by-product of dairy farming, so acreage data is included with dairy.

l Lard is a by-product of hog slaughter, so acreage data is included with pork.

m Derived from the yearly 5 million lb commercial Michigan catch for human consumption estimated by Asa Wright, Michigan DNR, Fisheries Division, using conversion factors from USDA Statistical Bulletin No. 616. Includes fresh, frozen, canned and cured fish in the same proportions as consumption for accurate comparison. Game fish not included.

n Includes: Half and half; light, heavy and sour cream; and yogurt.

o Includes: Whole, skim, flavored milk; lowfat milk drinks; buttermilk; and eggnog.

p Includes: Evaporated, condensed, and dry whole milk; dry buttermilk, whey, and malt; mellorine; and other frozen products.

q Included acres for replacement cows. Accounts for milk used on farm and wasted milk, 1.6% and 2% of total production respectively.

r Production retail weights are grain farm weights, and represent the percentage of corn and soybeans not attributed to Michigan animal or human consumption elsewhere on this chart. For corn, this is 60% of total production. For soybeans this is the meal portion (80%) of 31% of total production. The soy oil portion (18.33%) of this 31% is included in vegetable oil production, although acreage attributed to it is included here in exported soybean meal. Retail values are grain farm values.

s Production data for each grain represents that which is utilized for human

consumption. This data does not include oil. Specific data was not available for Michigan. Data was derived using National figures for the percentage of the totals used for human consumption as follows: corn-9.75%; oats-8%; barley-2.4%; Rye-14.7%; soybeans-2%. Sources: National Feed and Grain Association; American Soybean Association; and Corn Refiner's Association, Washington, D.C. Figures exclude grain used in alcohol production.

t Production retail weight and value represent whole grain weight and farm value. Since no corn is processed in Michigan for human consumption, the whole grain corn is exported and all processed products are then imported. Acreage included that attributed to corn oil in vegetable oils.

u Production retail weight and value represent the flour obtainable from 95% of the wheat grain sold by Michigan farmers. The other 5% is assumed to be used for animal feed. Michigan wheat is usually used for pastry and cake flour; the utilization varies depending on the price. If price is low enough, more may be used for animal feed.

v Production retail weight represents the lbs. of oil obtainable from corn and soybeans utilized for processing. Including oil, 10% of total corn grain production is utilized for human consumption. Of this amount, 2.5% is processed as oil. 98% of the total soybean production is processed yielding oil for human consumption and meal for animal feed. Of this amount, 18.33% is oil. Since there are no corn or soybean processing plants in Michigan, all grain for oil processing is exported and all oil products imported. Since we do not "produce" oil, production retail value is given as an average of the farm values of the grain equivalent of the oils. Acreage attributed to the grain equivalent of corn oil production is included in the corn grains for human consumption (see footnote +). Acreage attributed to the grain equivalent of soybean oil production is included in the meats, poultry, dairy, and exported grain categories.

w There was found to be no frozen corn processing in Michigan in 1980.

x Production Retail Weight is fresh weight estimated by Mr. Lenard Wilson, Great Lakes Mushroom Cooperative. Consumption Retail Weight derived from data provided by American Mushroom Institute.

y Included rhubarb, beets, and fresh peas.

z 1979 figures were used for all apple utilization weights since 1980 utilization weights were not available.

aa Includes brine cherries, canned and frozen.

bb A per capita consumption figure was not collected by any known agency. It is assumed that all produce in Michigan is consumed in Michigan through direct marketing. Production and consumption Retail Values were derived using the price received by growers listed in Non Citrus Fruits & Nuts, 1980

Annual Summary, Jan. 1981, USDA Crop Reporting Board.

cc Michigan does not produce grapes for raisins. Grapes produced for wine are not included.

dd Represents weight of sugar obtained from sugarbeet production. 1 lb. sugar equals 6.6 lbs sugarbeets, Michigan Department of Agriculture, Cooks Tour.

ee Represented by spearmint oil production. Retail weight given in lbs. of oil.

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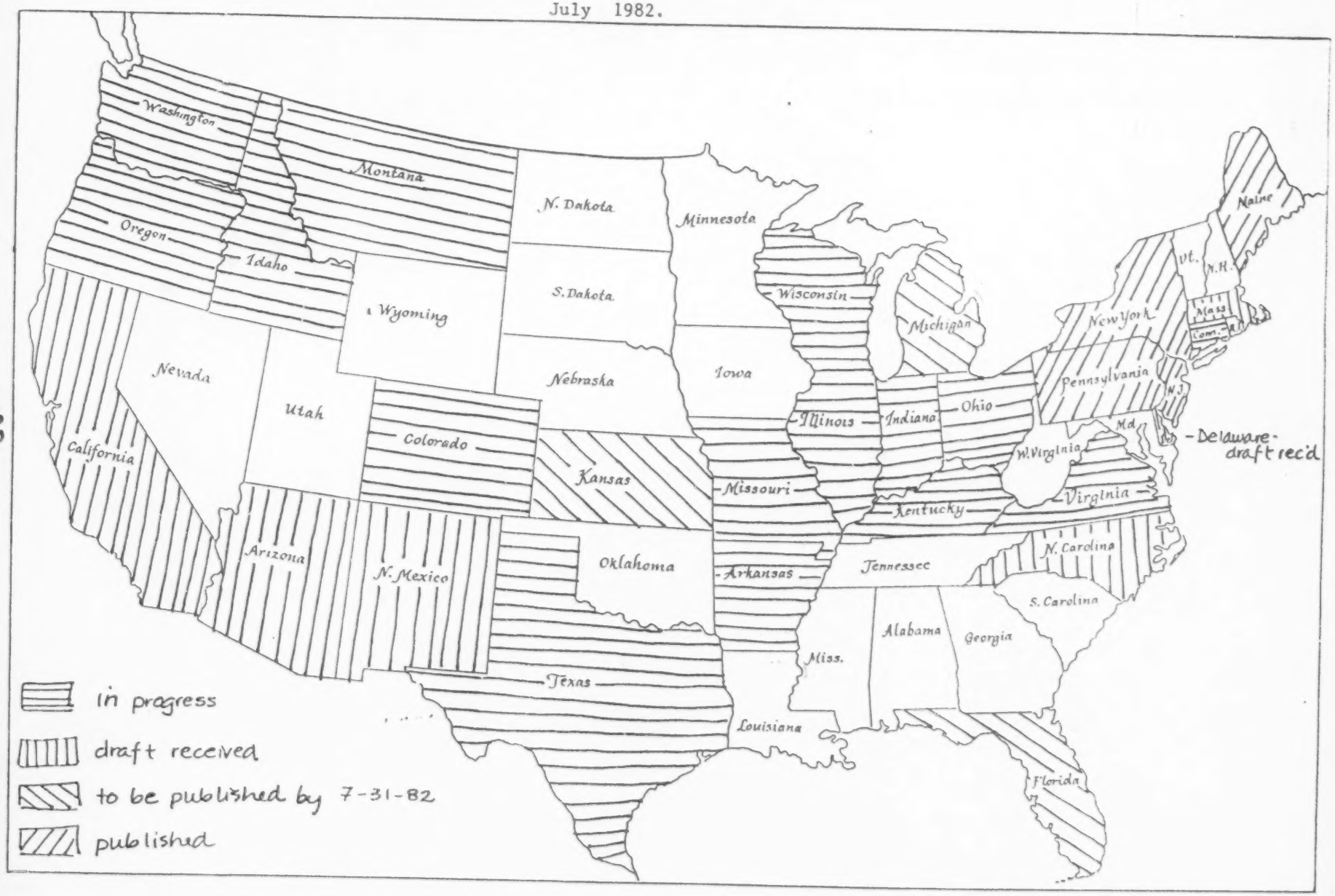

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